Getting
Started

NOAA Data in the Classroom

Objectives

Use Google Earth to bring current Earth science data into the classroom, in a user-friendly environment

Applications

Scientific method
Physical oceanography
Weather
Dynamic Earth

Tools

Google Earth software--
a free download
KML/Z files from multiple sources

Introducing Google Earth

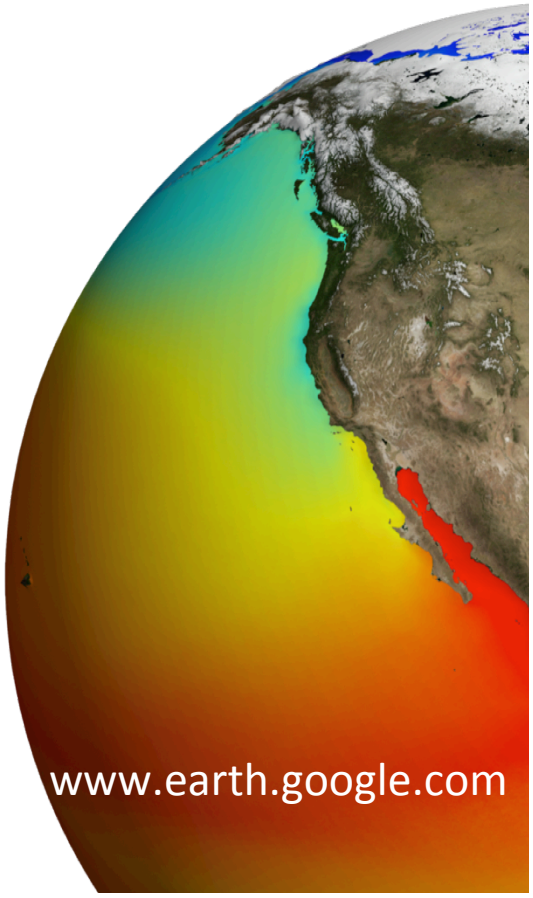
Google has revolutionized how we interact with digital data—access to obscure information on the Internet, sharing documents, getting from point A to B, and even seeing our planet Earth in a million different ways.

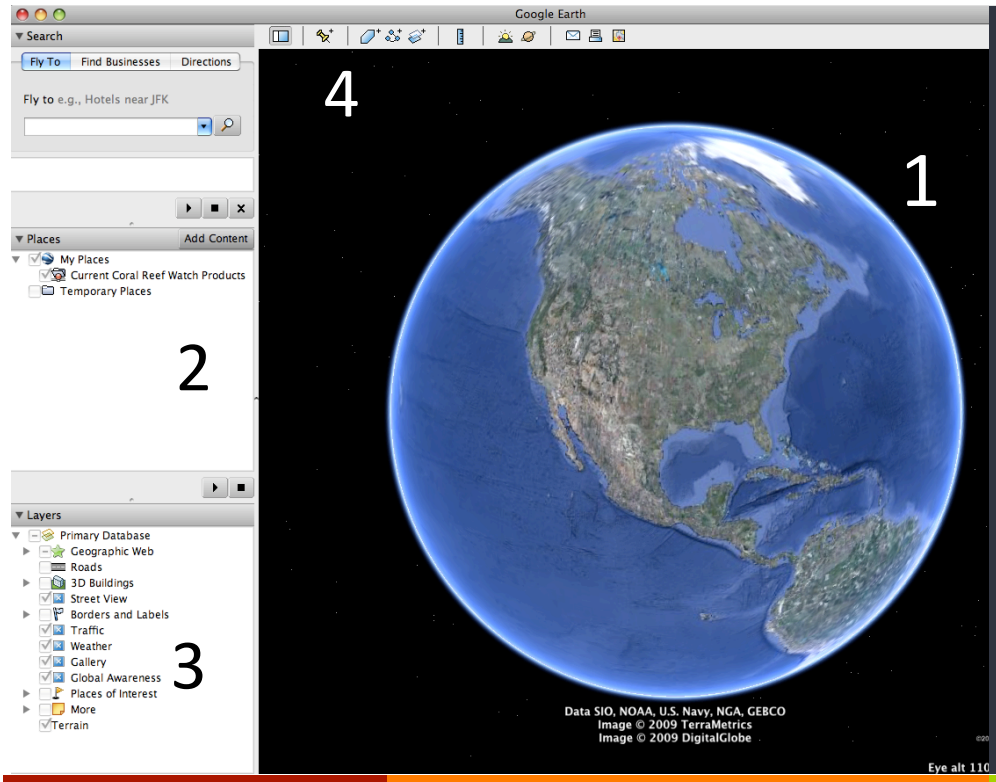
Google Earth is an incredibly useful tool for learning about our planet—and most importantly, its free. By loading files that change the way that the Google Earth is displayed, it is possible to see your local weather, zoom into an underwater mountain, sail from Boston to London, or even navigate the solar system.

But don't be fooled…not everything can be accomplished with Google Earth in its native form. Users, however, can customize how they interact with Google Earth by downloading and opening special Google Earth files. These files come in two flavors, KML and KMZ. Both are equally easy to use…KMZ usually have multiple files packaged together, such as several days of cloud images.

Once these files are loaded in, all the user needs to do is turn on and off the layers that they want visible, and navigate around the globe with a mouse. Often, the Google Earth files will provide links to other resources available on the Internet—and a web browser can be displayed within the Google Earth interface.

If you do not already have Google Earth installed on a computer, it can be downloaded directly from





The Google Earth Interface

The layout is straightforward:

1. Main Earth display
2. "Places" display: Data layers that you download & add
3. "Layers" display: data layers that come built-in to Google Earth
4. Toolbar

How to Use Google Earth

Navigating the Virtual Globe

Basic through advanced tutorials for using Google Earth can be found on the www.earth.google.com website. However, there are only a few basic skills that are needed.

1. Spin the globe around holding down the left mouse button and moving right or left.

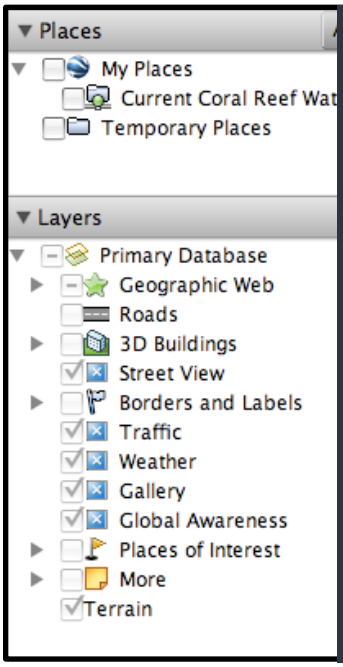
2. Zoom in or out using the middle scroll button on the mouse, or use the + and – symbols on the main display. Note, once Google Earth starts up, sometimes it begins to zoom in as far as possible. Simply click anywhere on the screen to stop it and zoom out to the desired level

3. Load KMZ or KML files by either double clicking on them in your computer files, Computers file folders, use the Google Earth menu File >> Open, or simply drag the file icon onto the Google Earth display.

   NOTE: The files you download will be shown in the "Places" display (Panel 2 above).

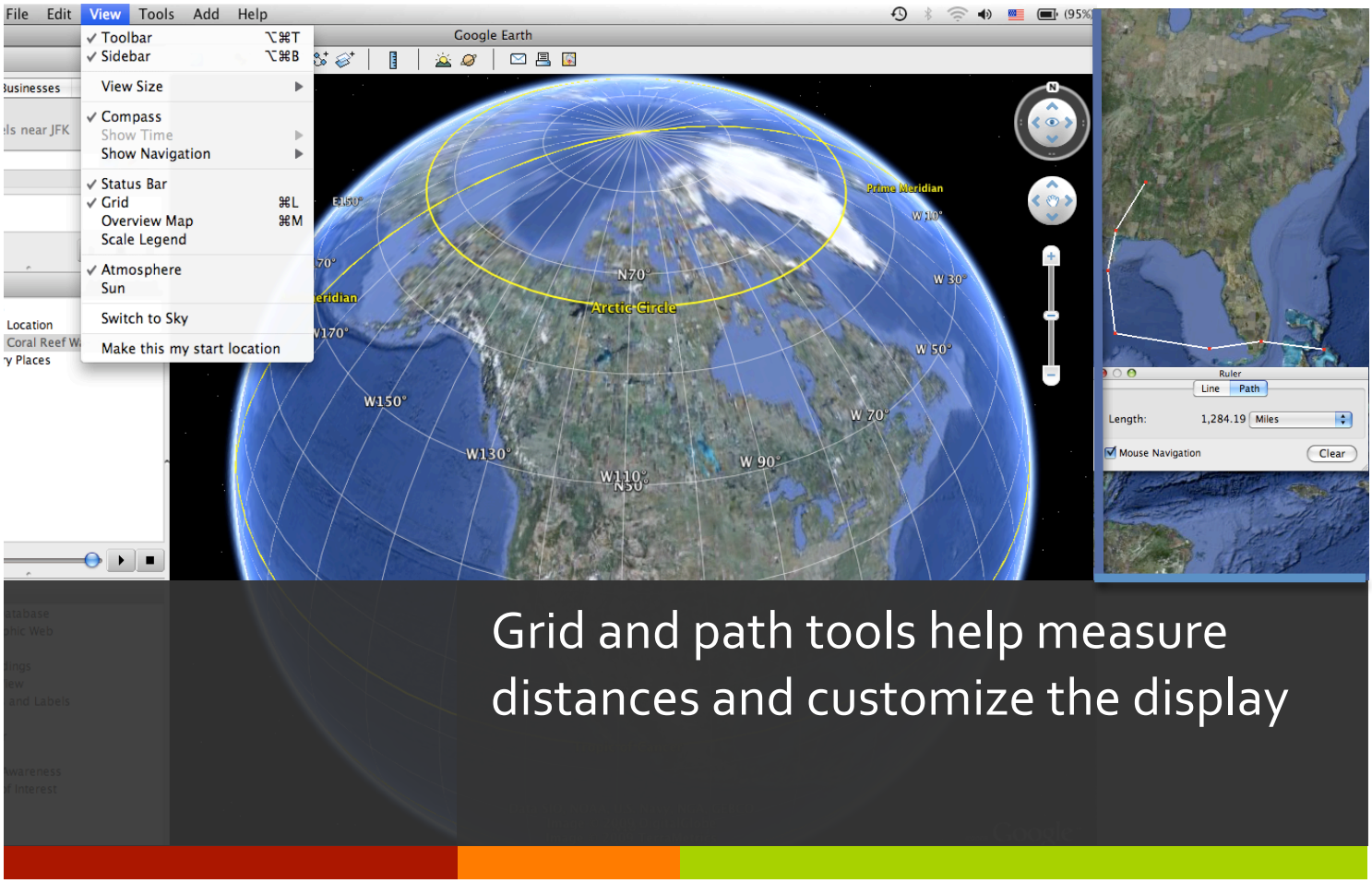
4. To display a layer, turn them "on" by checking the box to the left of the layer name in either Panel 2 or 3. Turn layers "off" by unchecking the box. If there is a arrow sign next to the box it means that there are multiple files that can be controlled. Simply click the arrow to expand the file tree and click away.

5. Animations can be seen



The Layers display shows several display options that come standard with Google Earth. For example, turn on real-time clouds by checking "Weather" and "Clouds"

By pressing the play button above the main Earth main Earth display. Some KMZ files from with very long timeseries of data, so it is necessary to drag and separate the right and left bookends on the time scale.



Google Earth Tools for Learning

There are many advanced options and plug-ins that can greatly expand the usability of Google Earth, however, the simplest ones tend to be the most useful for quick classroom use. Here we'll cover some of these simple tools, including using latitude and longitude, making measurements, and adding in images to specific locations on the globe.

Latitude and Longitude

Display the standard latitude and longitude grids by choosing Menu: View >> Grid. This option will not only provide better reference for navigating the globe, but is also instructive for teaching coordinate systems.

Making Measurements

With the Ruler tool (Menu: Tools >> Ruler), it is easy to make measurements between two points, or along a path. Simply open the toolbox, choose line (distance between two points) or path (multiple points), select the units you would like to measure in from the pull-down box, and start clicking on the map. The distance will be shown in the toolbox. Select "Clear" to remove the line.

Adding Image Layers

Start adding objects to the globe by adding place markers (Menu: Add >> Placemark), or even geo-referenced images. To add an image to a specific location on the globe, choose Menu: Add >> Image Overlay. Select "Browse" to find the image you'd like to add from your computer files, or if its online, just add the image's URL to the "Link" location. By selecting the "Location" tab, it is possible to specify where on the globe the image will be located. Input the north, south, east, and west bounds of the image and it will be geo-located on the globe.

For questions about any information presented here, please contact the NOAA Environmental Visualization Lab at nnvlwebmaster@noaa.gov

Favorite Google Earth Files for the Classroom

See the predicted paths for all current tropical cyclones, from all of the major weather models:
www.tropicalatlantic.com

Find the positions of NOAA's floating buoys with physical oceanography measurements:
www.nodc.noaa.gov/argo/data/kmz/argo_latest.kmz

Get daily temperature measurements from all over the globe, dating back centuries:
http://gis.ncdc.noaa.gov/aimstools/kml/gsod.kmz

The latest sea surface temperature data from satellites, along with info relating to El Nino and coral bleaching:
http://coralreefwatch.noaa.gov/satellite/education/index.html

Portal to multiple types of Google Earth information from NOAA:
http://www.srh.noaa.gov/gis/kml
http://www.epic.noaa.gov/talks/nns/forums/google.htm